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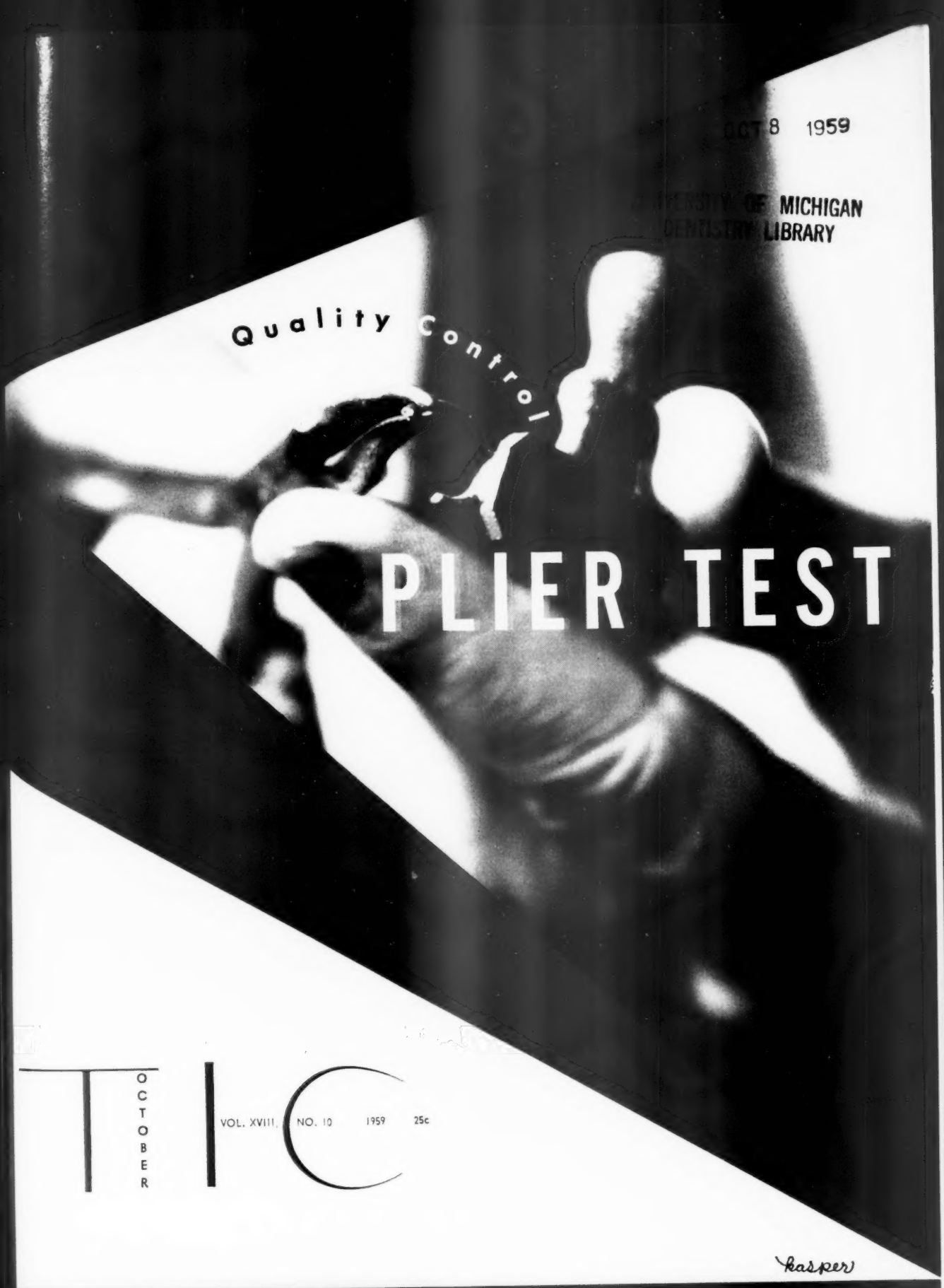

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A MAGAZINE FOR
DENTISTS
DENTAL HYGIENISTS
DENTAL ASSISTANTS

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October 1959 Vol. XVIII No. 10

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Winning THE PATIENT

By MAURICE J. TEITELBAUM, D.D.S.

You are established in the community. Your office is tastefully furnished. The patients are coming to you for dental work. Now, how can you win them over? How can you get the patient to accept the dental prescription you have prepared for him? Obviously, what is needed now is persuasion, tact, a winning way—in short, a good sales talk. Some time ago, the *Harvard Business Review* offered seven ways to be more persuasive in selling. In relation to the dynamics of selling dentistry, they may be stated as follows:

(1) *Agree with the patient before you disagree.* Agreeing with the patient before you disagree means the concession of minor points, at times, to be able to put across bigger ideas later. For example, if the patient needs a partial denture and expresses the opinion that the removable bridges always cause the teeth that are hooked to decay, you might agree with her. (Although you know that this is not *always* true.) For then you will better be able to put across the idea that jackets on the abutment teeth will protect them from caries and afford a better-fitting partial bridge. If you must disagree on an issue be tactful. Never blurt, "That's not true!" or "You're wrong!" This is a direct attack upon the patient's intelligence and a blow to his ego. You can put across your point and still not antagonize the patient if you say, "I understand how you feel, but—"; or, "I'm glad you brought that up, but—"; or "You have an interesting point there, however—". Conversely, when a patient makes a statement that you might agree with, such as, "My friend had a plastic bridge and it kept breaking so I'd like a metal bridge," compliment her on her good judgment.

(2) *Avoid arguments with the patient.* Arguing with a patient can easily destroy the very foundation of trust and confidence you have tried to build up in your appearance, the decor of your office, and the position you have established in the community. When you argue with a patient, even if you win you lose. The best advice on this point would be never to permit any discussion with the patient to reach the argument stage. Winning a dispute will, as Ben Franklin so aptly put it, be "an empty victory, because you will never get your opponent's good will." Besides, the patient is no opponent and without his good-will you cannot hope to "sell" dentistry.

(3) *If you err in judgment, admit it.* None of us are perfect.

If you plan to splint two teeth and then find that it will be necessary to add another tooth to the splint, tell the patient about it. The patient will more readily accept the change in plan and think more of you when you explain the change than she would if you failed to make the correction and subsequently the work failed. Try to avoid errors by taking the time to plan your cases carefully before presenting them to the patient.

(4) *Understand the patient's point of view.* In making an honest effort to understand the patient's point of view, you must be a good listener first and a good talker secondly. Encourage your patient to tell you about his oral condition, opinions of dental restorations, experience in dentistry, health habits, and so on. In this manner he will tend to uncover his defenses, give you a clue to his desires, and be more inclined to listen to what you have to say. Learning about the patient's understanding of dentistry will enable you to guide yourself as to how much you will have to explain to him. Don't take the patient's knowledge of dental procedures for granted. Beware of the patient who doesn't want you to explain your treatment plan fully and says, "Go right ahead, you're the doctor." Too many dentists have accepted this sort of "go-ahead signal" with the happy thought of avoiding any "wasted" time in outlining the dental procedures to be followed. After getting the patient's "go ahead," many a dentist has proceeded, full speed, to prepare teeth for jacket crowns only to have the patient suddenly raise his hand and cry out, "Wait a minute, doc, I didn't know you had to cut my teeth to put those crowns on!" Result—greater loss of time and a disturbed patient who is unwilling to go ahead with the work he might have accepted had he been properly prepared for it. To understand the patient's point of view, you must ask questions. The patient does not have to be given a course in dentistry, but he should know the whys and wherefores of the work being done for him. The patient who understands what you are trying to do for him is a better patient, a more cooperative and appreciative patient, and one who will be more apt to recommend others to you. No one wants to be in the dark about what is being done to him or what he is paying for. The dental patient is no exception.

"DURING THE LAST THREE MONTHS YOU'VE BEEN ON TIME FOR EVERY APPOINTMENT, MADE NO COMMENT ABOUT THE COST, AND BEEN EXTREMELY COOPERATIVE. MR. BENSON, JUST WHAT ARE YOU UP TO?"

(5) *Use ethical showmanship to put your ideas across.* Showmanship in dentistry is not something that a dentist is born with. Nor is it an exceptional gift. Every dentist has the tools at his disposal to be a good showman. The use of models, charts, before - and - after color slides, will dramatize your treatment plan more effectively than a shining personality or a flair for words. But this does not mean that words, the right choice of words. are unimportant. Semantics, the way we express ideas with words, has become increasingly more important in everything we do. For example, here are some "winning" words you can use, words to win over the patient. Say, "sensitive" instead of "hurt", "dressing" instead of "temporary filling," "remove teeth" instead of "pull teeth," "acrylic" instead of "plastic," "best in dentistry" instead of "guarantee," and so forth. Finally, stress elimination of cause rather than treatment of symptoms.

(6) *Learn to ask questions that will make it easier for the patient to say yes and agree with you.* Letting the patient feel he has a hand in making the decisions that affect him is psychologically sound. Although a certain amount of firmness helps to instil confidence in a patient as to a dentist's ability, a dictatorial approach, instead of keeping the patient in line, may very easily have the opposite effect. Sometimes the patient will, under such circumstances, feel that he is being treated as a child. His ego is slighted, and he may disregard the advice we give merely as a means of reasserting his independence. On the other hand, when a patient takes part in a decision, he feels more responsible in carrying it out and, as a result, is apt to be more cooperative. Once again the choice of the correct word is all-important. For

example, in prescribing any home treatment, how much better it is to say, "You'll find that so-and-so will be helpful," than "I want you to do so-and-so." Lead your patient to the psychological point at which he will be most receptive to your advice. When you sketch out the case for your patient, slant it so that he can plainly see what anyone with his condition would do or would need to have done. Then, put the following question to him: "If you were the dentist and I were the patient, what would you do?" All things being equal, the patient will probably give the advice you have indirectly suggested, and accept it. A good salesman learns to commit the customer to his ideas by subtly planting those ideas so casually that the customer will get to think about them on his own account.

In the final analysis, it is the appearance of the dentist, the decor of his office, the dentist's place in the community, and the manner in which he handles the patient that make for success in "selling." Whether it be dentistry or any of the other professions or businesses, successful selling requires a product, a customer, and a salesman who understands human relations. You are the "salesman," 170 million Americans are your "customers," and your "product" is the world's finest dentistry. So go ahead and get the patient to accept your dental treatment plan!

446 Clinton Place
Newark 12, N. J.

THE BILATERAL FREE-END SADDLE LOWER DENTURE

FINAL INSTALLMENT: By JOSEPH MURRAY, D.D.S.

Previous installments contained a description of design, impression-taking, occlusion, and new concepts concerning the free-end saddle or denture base (terminology recommended in *Glossary of Prosthodontic Terms*).

How does Doctor H. A. Young approach the problem of occlusal and prosthodontic trauma? His convictions are that the problem in the field of removable partial dentures is not solely one of equilibrating the occlusion or of fabricating a prosthesis to plug a gap in a row of teeth, but rather it is that of rebuilding, as nearly as possible, the components of the masticatory organ to an ideal or to original specifications.

It seems logical to assume, he says, that the cause of dental trauma is basically related to the force, whether associated with tooth occlusions or restorative appliances.

Doctor Young believes that it is a "horse-and-buggy approach" not to accept the concepts that:

1. Certain teeth are expendable in order to gain an improved over-all result.
2. Most abutment teeth require corrective restorations, the full veneer crown being preferred.
3. Unit casting of metal frames is the most satisfactory and economical fabricating method.
4. The incorporation of plastic denture bases for free-end partial dentures is the most satisfactory and economical way of caring for postinsertion ridge changes.
5. The use-period value and the remedial-restorative health value of a removable partial prosthesis is basically equal to that of any other dental restoration.
6. The science, skill, and experience required

in this field is equal to that required of any other branch of dentistry.

7. The restorative, remedial, and therapeutic values of restorations depend to a large degree upon the patient's good health and proper upkeep care, as well as upon the craftsmanship and the biologic and mechanical knowledge of the dentist to create, install, and maintain the restoration, be it a removable partial prosthesis, a fixed partial denture, or an individual tooth restoration.

Doctor Young uses the term occlusal equilibration as one designating a corrective procedure of abrasive reduction of cusp tips and cusp planes of natural teeth causing interference and injurious contacts in centric and eccentric occlusions. He notes that the procedures of correcting malocclusion of natural or artificial teeth are fairly parallel and have been amply discussed by clinicians.

He offers several methods of equilibrating occlusions:

1. Selective spot grinding.
2. Muscle or force balance.
3. Initial contact.
4. Oral abrasive paste milling.
5. Machine paste milling.

Doctor Young is in agreement with many periodontists who believe that although the removable partial denture is an appliance constructed to prevent trauma to the tooth-supporting tissues, the reverse may occur because of malocclusion and poor design.

Occlusal concepts cannot be complete without an opinion from Doctor Clyde H. Schuyler. He states that in the normal occlusion of the natural dentition, the lingual contour of the upper anterior teeth represents the incisal guidance. The latter is of such importance that it might be considered the key to eccentric functional occlusion of the posterior teeth and the key to the formation of the occlusal contours of the posterior teeth in complete oral rehabilitation.

Finally, we come to an important, often neglected, phase of partial denture construction: rebasing the saddle, especially the free-end base, after ridge resorption has taken place.

Doctor Blatterfein's Seven Groups

And no less an authority than Doctor Louis Blatterfein has the following advice to offer. He declares that the critical factors determining the rebasing procedures are:

1. The type of denture bases present on the partial denture.
2. The degree of ridge resorption under the bases.
3. The accuracy of the border extension.
4. The occlusion of artificial teeth on the denture bases.
5. The presence of framework rotation.

Doctor Blatterfein classifies partial dentures requiring rebasing into seven groups, according to clinical observation:

Group I. Tooth-bounded denture bases—slight ridge resorption.

Group II. Tooth-bounded bases—marked ridge resorption.

Group III. Free-end denture bases—slight ridge resorption.

Group IV. Free-end denture bases—moderate ridge resorption.

Group V. Free-end denture bases—marked ridge resorption.

Group VI. Free-end denture bases—excessive ridge resorption.

Group VII. Combination of bases of different groups.

It is obvious that no single technique can solve all rebasing problems. The main objective is to establish a new basal seat which can ordinarily be accomplished by the free-flowing materials like zinc oxide and eugenol impression pastes and plaster.

Where tissue changes are more marked, however, and relationship of framework to abutment teeth is disturbed, border, spacing, framework, and occlusion supplements must be added to the primary basing technique.

For example, in the free-end partial denture with *slight* ridge resorption (Group III), rebasing is usually indicated because of the restoration's instability. As a rule, little or no change has occurred in occlusal and framework relationship.

However, underextended borders, if present, must be built up to correct height and width with modeling compound and undercuts in the acrylic resin bases (usually in the lingual flanges) are removed and replaced—also with modeling compound—to facilitate flask separation during processing.

Now, the primary basing impression is made with a zinc oxide and eugenol paste. When seating the partial denture to position, caution must be taken to hold the fingers against the rests on the terminal abutments and all anterior framework contacts. Advising the patient to close into centric occlusion is forbidden because unequal pressure on the ridges, framework rotation, or both, may result.

Upon setting, the partial denture is removed, the excess paste trimmed with a warmed sharp knife, and the corrected restoration reseated and tested for stability. If the desired result is short of expectations, then another layer of paste is added to the impression surface of the bases and the process is repeated.

After processing, premature occlusion usually results. This inocuous change can readily be remedied by modest intraoral grinding.

Moderate Ridge Resorption

For rebasing free-end dentures with *moderate* ridge resorption (Group IV), Doctor Blatterfein recommends that a spacing supplement (modeling compound) be added to correct the discrepancies between the bases and the ridges.

After grinding away the acrylic resin from the impression surfaces so that a minimum of 2 mm. of space remains, stick or wafer compound, thoroughly heated with a pointed alcohol flame, is applied to the bases, tempered by immersing the partial denture into hot water for thirty seconds, then seating it in the mouth. This tempering process allows heat to penetrate the acrylic thus keeping the compound soft and minimizing tissue displacement.

The restoration is removed, excess modeling compound is trimmed, overextensions are cut down, underextended borders are built up, and a thin layer of zinc oxide and eugenol impression paste is added to complete the rebasing procedure. After setting, the excess paste is removed and the denture reseated and tested for stability and occlusion.

In these cases, stability is usually good, but if occlusal discrepancies cannot be corrected by reasonable grinding—then an occlusion supplement will be necessary—if tooth mutilation is to be avoided. Also, this will take us into the next classification, Group V.

Marked Ridge Resorption

Here, we meet the problem of *marked* ridge resorption under free-end partial denture bases, which introduces not only a disturbance of the occlusal contacts but a rotation of the framework.

This necessitates the addition of framework and occlusion supplements to the primary basing procedure with its spacing and border additions used in less pronounced ridge resorption conditions.

First, the partial denture is prepared for the spacing supplement by grinding 2 mm. or more from the impression surfaces of the bases. Then, stick or wafer modeling compound is applied, thoroughly heated and tempered, and inserted into the mouth, careful that the framework is rotated back to its original relationship with the natural teeth.

Now, the fingers are placed firmly on the terminal rests and on as many contacts as possible anterior to these stops. After thirty seconds, the denture is removed and chilled in ice water. It is returned to the mouth and tested for framework repositioning and denture stability. Usually, the former is correct but the degree of stability is inadequate.

Warmed, tempered compound is added to the posterior two-thirds of the denture bases and reseated, being careful to maintain correctly the contact of the framework against the natural teeth. The denture is removed, the compound chilled, and the stability of the bases tested.

If that is inadequate, additional modeling compound is applied to the posterior half of the bases only, and heating, tempering, chilling, and testing are repeated.

With attainment of denture base stability and framework repositioning, the spacing and framework supplements have been completed. Next, the border supplements must be corrected by trimming excess compound in overextension or adding to underextension regions.

The denture is reseated, and if the borders are correct, a thin zinc oxide and eugenol impression paste registration is made as for the preceding groups —maintaining the repositioning of the framework by firm finger pressure until the paste has set. The excess is trimmed with a warmed sharp knife and the restoration is returned to the mouth.

The occlusion will be premature because of the repositioning of the framework and the spacing supplement. Grinding will mutilate the artificial teeth, therefore an occlusion supplement is necessary.

Using a heatless stone, the teeth are completely ground away; as much denture base material as space permits is removed; excess compound and paste are trimmed from the base areas posterior to the artificial teeth; and the partial denture is reseated in the mouth and checked for adequate clearance in centric position.

Pink base plate wax occlusion rims are adapted where the denture teeth were removed and the patient is guided to close in centric relation on the softened rims. Then, four layers of base plate wax, three-quarters of an inch wide and horseshoe-shaped, are used to make an interocclusal record-impression of the natural teeth anterior to the denture bases, and of the opposing teeth. This is done to provide an approximate model of the remaining natural teeth so that the new artificial dentition can be set up with greater facility.

An alginate impression of the opposing teeth and jaw is now taken—and a face-bow record, too, if necessary. The resultant cast is mounted on an adjustable articulator; the interocclusal record-impression is waxed to the rebased partial denture and a stone cast is poured.

The upper and lower casts are sealed together according to the centric relation record; then the lower is mounted on the articulator.

Next, the rebased partial denture is separated and the old acrylic resin bases are stripped from the metal framework, which is waxed to the cast. New artificial posterior teeth are set into occlusion.

The rebased denture is processed; the restoration is inserted and the occlusion equilibrated intraorally, if natural opposing teeth are present; or, an interocclusal record remount technique is used if a full denture or an extensive partial appliance is in the opposite jaw.

Excessive Ridge Resorption

In free-end denture bases with *excessive* ridge resorption (Group VI), when no noticeable tooth movement has occurred, the existing framework can be salvaged and attached to a stone cast reproduced from a suitable impression.

It is important that the framework be properly seated or failure will result. Base trays and occlusal rims are attached to the metal framework for making jaw relation records and the procedure similar to that used in the construction of a new denture is followed.

Frequently, partial dentures have a *combination of tooth-bounded and free-end denture bases.* Doctor Blatterfein identifies this type as Group VII.

If rebasing is necessary, an independent analysis is made of each saddle and classified in the proper group. Sometimes both bases are corrected simultaneously, but, if a big difference in procedure exists, then the simpler correction is made first, followed by the one requiring the more intricate technique.

By realizing that the problems in rebasing partial dentures are quite complex; that structural changes occur after such restorations are inserted and worn; and, by recognizing and remedying these changes by procedures which will preserve the remaining structures in the mouth, Doctor Blatterfein has taken the art of rebasing out of the "hit-and-miss" category. The general dental practitioner can do it, too.

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ETHYL CHLORIDE: Pain Killer

By CHARLES A. LEVINSON, D.M.D.

It is amazing to learn of the great number of persons who will not visit a dentist because of the fear of pain. Yet, in this modern age, we as dentists know that we can administer the "drilling of cavities" as painlessly as possible. We have at our command so many local and general anesthetics which are so helpful to both the patient and the dentist.

The term anesthesia (without sensation), which was suggested in 1846 by Oliver Wendell Holmes, is usually defined as an artificial deprivation of all sense of sensation, while the mere absence of pain is referred to as analgesia. Correctly speaking, the term local anesthesia is partially a misnomer. In producing local anesthesia we do not fully comply with all the requirements that anesthesia demands, because a part of the sensorium—the sense of touch and that of temperature, for instance— is not fully abolished.

Analgesia, i.e., loss of sensibility to pain or absence of pain, would be a better term. The term local anesthesia has, however, acquired such universal recognition that it would seem unwise to recommend a change.

One of the local anesthetics which has been neglected as an inhibitor of pain in drilling is ethyl chloride.

Dentists have long known its use as a refrigerant and local anesthetic for the extraction of teeth, especially in children, immediate removal of the pulp, opening of abscesses, and other minor operations about the oral cavity.

Ethyl chloride, C_2H_5Cl, is a haloid derivative, prepared by the action of hydrochloric acid gas on absolute alcohol. At normal temperature, ethyl chloride is a gas, and under a pressure of two atmospheres it condenses to a colorless, mobile, very volatile liquid, having a characteristic, rather agreeable odor and burning taste. It boils at about 55° F (13° C) and is very inflammable, burning with a smoky, green-edged flame. It is stored in sealed glass or metal tubes, and when liberated at ordinary room temperature (70° F, 21° C) it evaporates at once. In commerce it is supplied in plain or graduated glass tubes of from 3 to 60 grams capacity, or stored in metal cylinders holding from 60 to 100 grams or more.

For the past several years I have had the successful use of ethyl chloride as a pain-killer in cavity preparation in about 80 per cent of my patients. It works wonderfully well on youngsters. There have been some adult cases in which it has not proved successful, and I had to resort to injected ravocaine or some other local anesthetic.

The technique is simple. Insert the saliva ejector; make certain that you place plenty of cotton rolls at the site of the salivary ducts. A maximum of dryness of the oral cavity must be maintained. On very sensitive gum tissue, first dry the tissue well and apply a little rubbing of white vaseline. In most cases you can eliminate use of vaseline. Then spray the ethyl chloride onto a cotton roll, saturate it well, place in the buccal fold of the mouth, and proceed to drill. Use a new, sharp drill with each application. You can also place a little mineral oil on the drill and in the cavity proper; this cuts down heat friction also.

As you are drilling, ask your patient to inhale a little. Occasionally light forms of general anesthesia are induced by inhaling the vapor. The frigidity of the ethyl choride numbs the area, so that pain is cut down quite a lot.

The intense pain produced by the extreme cold prohibits its use in pulpitis and acute pericementitis.

Caution should be exercised in using ethyl chloride near an open flame or in conjunction with the thermo-cautery, as severe burns have resulted by setting the inflammable vapor on fire.

This new technique has been neglected in many dental offices all over the country. With our new high-speed drills, it is amazing how quickly the worst of the "cavity drilling" can be accomplished with a minimum of pain.

There is a lot to be developed in the use of this new technique as a pain killer in drilling. Other dentists should try it and develop through their experiments many factors which will bring more patients into dental offices, and thus try to save their dental members.

100 Boylston Street
Boston, Mass.

At your service:

WHAT THE A EAN

PART 9: By GE STI

In a suite of rooms in the National Bureau of Standards building in Washington, D. C., are a group of dedicated, talented men who probably are doing as much as any other group in America to help dentistry maintain a rapid tempo of progress in the development of dental materials, equipment, and techniques.

These men include dentists, physicists, chemists, engineers, metallurgists, and crystallographers. They work as a team, their coordinated efforts focused upon the physical and chemical properties of dental materials and on the hard dental tissues.

They constitute the staff of the Dental Research Section at the Bureau a program operated by the Bureau and the ADA for thirty years, with the cooperation of the federal dental services—Army, Navy, Air Force, and Veterans Administration.

Chief of the section is W. T. Sweeney, who has had extensive experience in the field of dental materials. Another key member of the staff is one of the pioneer dental researchers of our time, Doctor George C. Paffenbarger, who carries the title of senior research associate.

One of the major achievements of these men and their colleagues is to help translate promise into performance, and to do it as quickly as possible. For example: the gap between the development of new dental techniques and the production of new instruments and their application in dental practice has always been a substantial one. Such delay is commonly true of all scientific professions. But the Bureau's work on studying physical and chemical properties of dental materials and developing specifications has reduced this lag and has put the use of these materials on a sound scientific basis. All of this means that dentists can introduce these new developments in their practices with a minimum of delay and a maximum of professional security.

In fact, the history of operative and prosthetic dentistry during the last half-century has been primarily a record of discovery, development, and application of new materials and new instruments. Doctor Paffenbarger reminds us that, until 1926, there were no standards or specifications for such unique dental materials as amalgam. "In that year, Doctor Wilmer Souder and his co-workers at the Bureau form-

Doctor rger

Fig. 1. The excessive expansion of zinc-containing amalgam contaminated by moisture is manifested by the broken glass tubes on the right. The tubes on the left were packed with the same amalgam, uncontaminated with water.

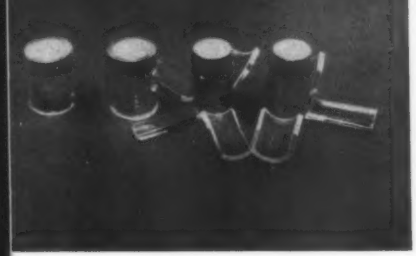


Fig. 2. The solubility test for dental silicate cement employs the weighing bottles shown here. The bottle on the far left has been cleaned and weighed. Two silicate cement disks, 20 mm. in diameter, are submerged for 24 hours in distilled water at mouth temperature (second bottle from left). The disks are then removed and the water is carefully evaporated, leaving a residue. If the cement has a low solubility, the residue will make a thin coating in the bottle (third from left). If the cement has a high solubility, the residue will be heavier.

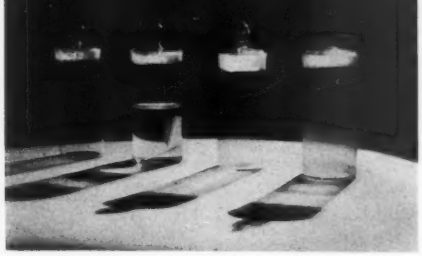


Fig. 3. Inspection of experimental restoratio silicate cement with a binocular microscope great aid in observing small differences in havior of the fillings over a short period of

A[illegible]EANS TO YOU

9: By [illegible]GE STRACK

Doctor [illegible]erger

ulated a specification for dental amalgam," he says. "From his initial work and guidance, the American Dental Association now has standards for amalgam, inlay casting investment, impression compound, inlay casting wax, inlay casting gold alloys, mercury, wrought gold wire, zinc phosphate cement, silicate cement, denture rubber, hydrocolloidal impression materials, denture base resin, self-curing repair resin, chromium-cobalt casting alloy, and plastic teeth."

Many of these specifications are under revision at present and specifications for eleven other materials are now in preparation. This work is being done by the Specification Committee of the Dental Materials Group of the International Association for Dental Research and ten subcommittees, under the chairmanship of Walter S. Crowell. The committee functions as the principal consultant on dental materials to the ADA's Council on Dental Research.

American dentists and their patients benefit immeasurably from the Council's program for the certification of dental materials. The program works like this: a manufacturer certifies to the ADA that his product complies with the ADA's specifications. The ADA tests the product. If it is found to comply with the specifications, the product is added to the List of Certified Dental Materials.

The List is published every two years by the Association, along with the specifications, a list of over 300 publications of the research section, and data on the certification program, in *American Dental Association Specifications for Dental Materials.* The book costs $2.25. Every dentist ought to have a copy of it.

Other activities of the Dental Research Section include the determination of those physical and chemical properties of dental materials which have a dental significance, and the influence of technique upon these properties. One illustration of this is the excessive expansion of a moisture-contaminated, zinc-containing amalgam, as shown in Fig. 1.

Doctor Paffenbarger talks about some of the activities of the research unit:

"Another important aspect of the work is the correlation of the laboratory work with the clinical practice of dentistry in the one-chair experimental operating room at the Bureau. Fig 2 shows a test

[illegible]4. Two adjacent silicate cement fillings made [illegible]e same cement show gross differences within [illegible]o a few weeks of insertion. The good filling on [illegible]eft was made from a mix spatulated for 30 sec[illegible]on a slab at 60°F. Immediately after removal [illegible]e matrix strip, the filling was covered with pet[illegible]um and finishing was deferred for one week. [illegible]estoration on the right was made from a mix [illegible]ulated for two minutes on a slab at 98°F. After [illegible]val of the matrix strip, saliva came in contact [illegible]the filling. It was immediately dressed flush [illegible]the enamel margins and the patient was dis[illegible]ed.

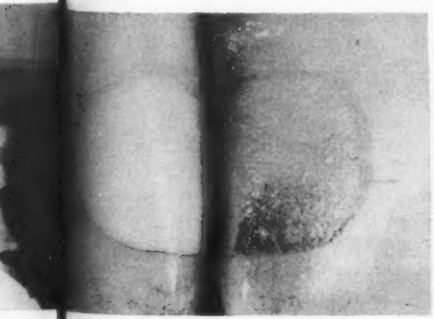


Fig. 5. Knoop indentation hardness marks near the dentin—enamel junction on a transverse section of the crown of a lower first molar. The long marks are in the softer dentin, the short marks in the harder enamel. The enamel fractured some around the marks because the enamel surface on which they were made was not highly polished. It is difficult to polish dentin and enamel in the same plane because of their difference in hardness. Each scale division represents 10 microns.

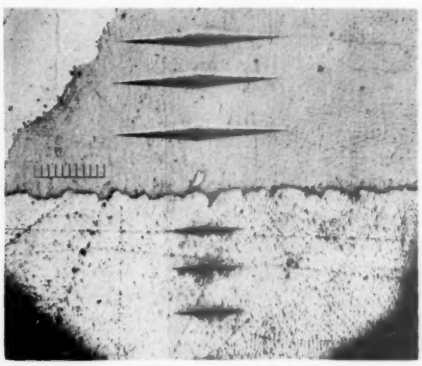
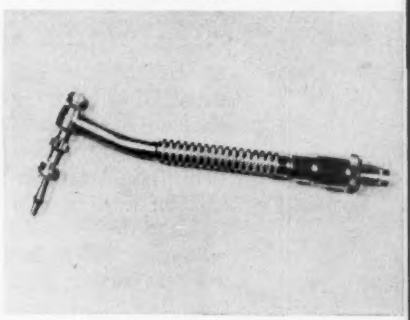


Fig. 6. An exploded view of the hydraulic-turbine contra-angle handpiece developed in the cooperative research between the ADA and the Bureau. Water under pressure comes through a tube in the stem and strikes the turbine, spinning it at 45,000 to 60,000 revolutions a minute. This speed is very efficient in cutting the hard tooth tissues with diamond-coated instruments.



for the solubility of silicate cement in distilled water. To the tared weighing bottle on the far left are added distilled water and two disks of silicate cement as shown in the next weighing bottle (second from left). After soaking for twenty-four hours, the silicate cement specimens are removed and the water is evaporated. The amount of material dissolved out of the silicate cement specimens is shown by the residue. The more dissolved, the heavier the residue, as shown by comparing the appearance of the two weighing bottles on the right.

"The same solubility effect can be shown by making a thin and a thick mix of the same silicate cement. If restorations are placed side by side, one restoration made with a thick mix and the other with a thin mix, the differences will be large enough to see (Fig. 3). An example of what can be seen is shown in Fig. 4. Here are two silicate cement restorations made from the same brand of silicate cement but by proper technics (left filling) and improper technics (right filling)."

The unit has done much work in recent years on the physical and chemical properties of the hard tooth tissues. This includes probing into the crystal structure of the mineral content and measuring the fluorescence, the strength, and the hardness. Fig. 5 gives an example of this type of investigation, showing the relative hardness of dentin and enamel at the dentine-enamel junction. These Knoop indentation marks were made in 1938 on the original hardness testing machine developed at the National Bureau of Standards.

W. T. Sweeney, Chief, Dental Research Laboratory, National Bureau of Standards.

An outstanding achievement of the unit was the development of the first fluid driven contra-angle dental handpiece employing a small turbine in the head of the handpiece (Fig. 6). It was from this instrument that the air-driven handpieces using a turbine were derived.

An important aid to the dentist is the unit's motion pictures showing how the research work on

Biographical Outline of a Dental Leader

George Corbly Paffenbarger was born in McArthur, Ohio. He graduated from the College of Dentistry, Ohio State University, in 1924 with honors. Twenty years later his alma mater conferred the honorary degree of doctor of science upon him.

After graduation from Ohio State University, Doctor Paffenbarger was associated with his father in the practice of dentistry at McArthur, Ohio, 1924-25. Following this, he was an externe at the Palama Settlement Dental Clinic, Honolulu, Territory of Hawaii, 1925-26; instructor in the College of Dentistry, Ohio State University, 1927-28; and research associate of the American Dental Association at the National Bureau of Standards, 1929-41, and since 1946. The American Dental Association gave him a leave of absence from 1942-46 to serve in the Dental Corps of the United States Navy at the Naval Medical Supply Depot, Brooklyn, New York. During this five-year-period, Doctor Paffenbarger was advanced from lieutenant commander to commodore, thus becoming the first Reserve dental officer to attain flag or general rank in all of the Armed Forces. He now holds the rank of rear admiral in the U. S. Navy Reserve.

In the science of dental materials, Doctor Paffenbarger is a world authority. His published reports have been quoted in practically every foreign dental journal. He is co-author, with Wilmer Souder, of *The Physical Properties of Dental Materials.* He is, or has been, consultant in dental research to the United States Public Health Service, the Navy, and the Army Dental Services. He is a member of the American Dental Association, the Federation Dentaire Internationale and a fellow of the American College of Dentists, the New York Academy of Dentistry and the American Association for the Advancement of Science. In 1954 he was president of the International Association for Dental Research. He is also a member of Sigma Xi, Omicron Kappa Upsilon and Xi Psi Phi.

dental materials may be transferred to chairside practice. Ten films have been made on such subjects as silicate cement; dental amalgam; failure caused by moisture contamination; denture resin; the casting of dental gold alloys; thermal expansion technique; a method of mixing silicate cement; the hazards of dental radiography; dental materials; specification and certification; a porcelain jacket crown technique; dental burs in action; dental X-ray equipment; alteration for modern radiation hygiene.

Dentists who are interested in these films—and what dentist is not?—can borrow them by applying to the Office of Technical Information, National Bureau of Standards, Washington 25, D. C. Or to the American Dental Association Film Library, 222 East Superior Street, Chicago 11, Illinois.

Doctor Paffenbarger has seen much dental progress made. In his opinion, the greatest single advancement in operative dentistry in the last fifty years is the inlay casting process.

"Amalgam is still the most important therapeutic material used in restorative dentistry." he says. "By far the two most important developments are: (1) the knowledge that excessive corrosion and expansion with their frequent accompaniment of postoperative pain, is caused by contaminating zinc-containing amalgam with moisture; and (2) the influence of technic upon the physical properties. These laboratory investigations explained a whole host of clinical observations on the behavior of amalgam, and present a good example of how the research laboratory was able to discover that which thousands of dentists observing millions of amalgam restorations for decades were unable to do."

Still looking back, he observes: "The development of investments, gold based and chromium based alloys, hydrocolloidal duplicating and impression materials, together with more precise and less time-consuming technics and the advent of the commercial dental laboratory, changed the practice of prosthetic dentistry. The cast partial denture is probably the one single item most responsible for this change because its fabrication by the dentist was so time consuming."

What is on the way? "The state of research on the development of a new plastic alloy will be revitalized or a modification of the old amalgam will take place. The elimination of zinc, the substitution of other elements such as indium or gallium for some of those now present, and new applications of metallurgical science—these we think are in the offing."

Here is another development Doctor Paffenbarger looks forward to: "Zinc phosphate cement, the best luting material that the dentist now has, is extremely unsatisfactory as it disintegrates rapidly in the mouth and is not adhesive. It is essentially the same as it was about 1900. Surely one of the most important advances to come in operative dentistry would be the development of an insoluable adhesive resinous cement that would not irritate the pulp. The development of such materials will follow the increasing tempo of the advancement of science in general."

Dentists can be assured that a respectable amount of this progress will be realized through the brilliant, dedicated efforts of researchers sponsored and encouraged by the National Bureau of Standards, American Dental Association, and the federal dental services.

DEEP FREEZE DENTISTRY

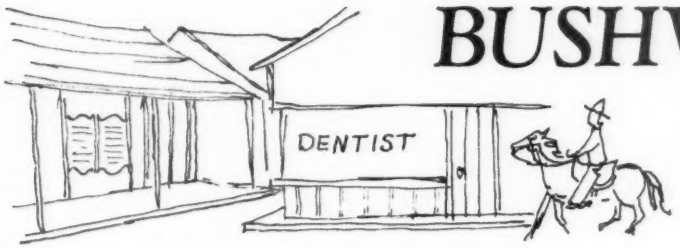
ANTARCTICA—Navy Dentist Lt. Max J. Perlitsh, son of Mrs. Rose A. Perlitsh of Medford, Mass., performs a dental check-up on one of his patients while in Antarctica, as a member of Operation Deepfreeze IV.

He has returned to the United States after "wintering over" in Antarctica as part of a Navy Support unit for the International Geophysical Year.

Navy personnel served at seven science stations which were built by Navy Construction Battalions during Operation Deepfreeze I and II.

The Navy men, in some cases, spent more than a year in the Antarctic maintaining the stations for scientists while data were gathered on ionosphere, geomagnetism, meteorology, aurora, airglow and other geophysical sciences.

CONFESSIONS of a BUSHWHACKER



By ANONYMOUS

In 1918 when flu was prevalent and many died from it, I contracted it so many times my physician friend who took care of me advised me to stop practicing dentistry and go out west, for he was sure I was taking the disease from my patients. He thought a year or so in the open air would build up my resistance. I took his advice.

I won't name the intermountain state I went to. I got a job almost at once with a widely known construction company that was building an irrigation dam to furnish water for thousands of acres of land.

In my job as material man, I did all the ordering of everything that went into the construction of the dam, such as dynamite, black powder for blasting, cement, feed for a hundred head of work stock, kitchen supplies to feed six hundred men, and coal for the two dummy engines that pulled trains of flat cars from the borrow pit to the dam. This was a great change of work for a dentist to make.

It seemed that every day someone working on the dam was hurt. The superintendent learned in some way that I was a graduate in dentistry. He was a Dartmouth man. He asked me to take care of those who got hurt on the job, for it was thirty miles to the nearest physician. I took over the responsibility and the superintendent increased my paycheck for my so-called medical services.

So there I was, practicing medicine without a license.

Although most of the workers were Basques, we did have a few Mexicans as scrapermen. They drove mule and horse teams, putting in the earth fill of the dam. One of them was the most inhumane man I ever saw. One day I caught him beating his mules with a board into which he had driven a sharp nail. Blood was oozing from a mule's hide. I warned the man that if I ever saw him beat his team with the board again, I would fire him. The next day I caught him doing it again, and sent him to the timekeeper for his pay. All the other Mexicans quit when I fired the man. Since I was responsible for the condition of the work stock, I had two mules to doctor up. So now I found myself practicing veterinary medicine—for it was a hundred miles to the nearest D.V.M.

The job at the dam lasted until fall, when it began to get cold, too cold to continue work that high up in the mountains. When the work was shut down, I moved into the nearest town, which was thirty-five miles south.

My brother had a drugstore in the town I moved into, and had told the mayor I was a dentist. It was a long way to the nearest dentist. The mayor, a very fine man, asked me to set up a dental office in the town. I told him I did not have a state license to practice in that state, although I had had one in the state I came from. I also explained that I did not have instruments or supplies necessary to set up an office.

He said, "The hell with all that foolishness about a state license! We need you here. An old dentist came here to prove up on an irrigated claim and died out on it. His widow has his instruments and supplies out on the claim. I can get them from her for you."

The town had a young physician who had come west from an eastern state. While talking to him, my wife and I learned he and she were related. He was the railroad physician for the railroad that was building a branch line a hundred miles northwest of the town. He told me he had to visit six railroad camps of construction workers every week. He suggested that, while he was out to the camps, I look after his office. If so, I could office with him and he would ask no rent of me. Well, there I was, pushed into bushwhacking again—in both medicine and dentistry!

I rented a furnished house at the edge of town. One evening when it was as dark as pitch there came a knock at our door. It was three Spaniards, all of them with raging toothaches. They wanted me to go back to the office and extract their teeth. Of

course I could not refuse, so went back to town with them.

Each was carrying his bedroll and each had walked twenty-five miles that day from the railroad camp and had eaten nothing all day. Only one of them could speak English.

At the office I had one sit down in my rented barber chair. I found the aching tooth, shot in an anesthetic, and took out the tooth. The guy promptly fainted.

We carried him into Doctor B's apartment, which was connected with his office, and laid the man on the floor. Then we went back to my office, and the second man sat down in the chair. I took out his aching tooth, and he, too, passed out. I had to help carry him out also and we laid him on the floor beside the first man. The one who could speak English told me none of them had slept at all the night before on account of toothache, and had carried their big bedrolls all day. They were completely bushed.

The English-speaking Spaniard sat down in my chair and he, too, passed out on me. I had to drag him out by myself and laid him on the floor beside the other two. I was a very busy bushwhacker for several minutes as I worked to bring those three guys back to consciousness. Some of Doctor B's whiskey helped.

Doctor B had expected me to take care of minor injuries for him that he might send in from the railroad camps along with cases of colds, grippe, and so forth.

One evening about five o'clock when Doctor B was out at the railroad camps, my brother at the drugstore telephoned me and said a badly beaten up stranger was at the drugstore. He had been worked over by a town gang of roughnecks. He asked if I would go over to the drugstore and take care of the man. I could not refuse, of course. The man's eyes were nearly closed and there were several cuts on his face and one in his scalp. I cleaned him up; then, after washing out the cuts with a weak carbolic solution, I drew the edges of the cuts together and held them so with C O. He was well bandaged up when I finished with him. He asked how much he owed and I told him I was a good Samaritan and was charging him nothing.

The story behind the attack was that the gang thought he was a prohibition agent, so they jumped him. Some of the counties in the state were wet and some were dry. We were in a dry county.

The town marshal and I took the man to the evening train and saw him out of town. At the depot the man explained he had been sent out from Washington to make a soil analysis of the land being irrigated!

Just before Thanksgiving that year my wife and I returned to our home state and I went back to dentistry. I don't criticize bushwhackers too much now.

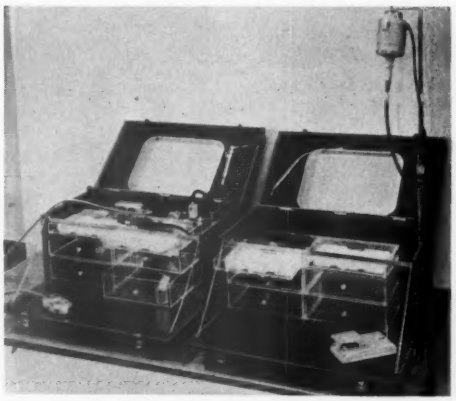
For Home and Bedside

Portable dental equipment which may enable dentists to give home or bedside treatment to persons who are too disabled to visit a dentist's office is being tested by the Public Health Service.

The portable equipment consists of two forty-five-pound cases of instruments which can be operated from an ordinary household electrical outlet.

Two models are now being tested; one in Kansas City, Missouri, where the Public Health Service has a dental research project housed in the University of Kansas City Dental School; and the other in New York City, where both the city health department and the Brooklyn Jewish Chronic Disease Hospital are cooperating in the study.

There are an estimated 5.5 million persons in this country who are too disabled to visit a dentist, the Service noted, and many of them need dental care. At present, because dental equipment is not movable, they receive only emergency treatment.



If the test models are approved, commercial production can be expected. In addition to dentists in private practice, the equipment would probably be useful to health departments, hospitals, nursing homes, homes for the aged and various other health organizations.

A CENTURY OF PROGRESS: DENTAL EQUIPMENT

Part 10: By CURT M. PROSKAUER, D.M.D.

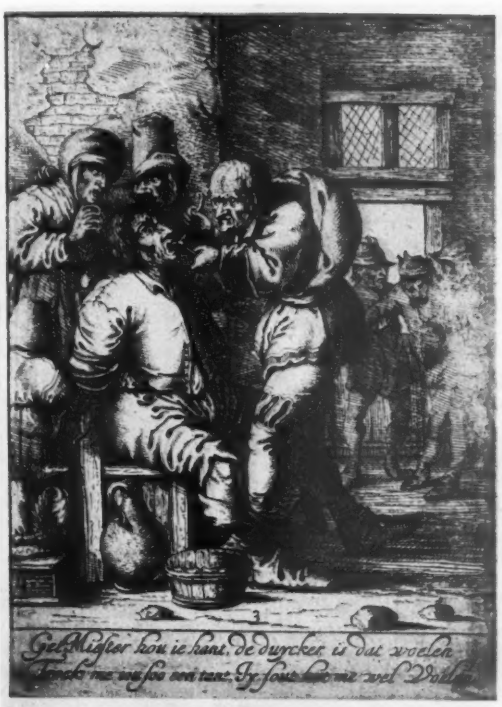
In the seventeenth century the patient had to be bound to his chair during the extraction of a tooth; otherwise the terrible pain would have made him move unexpectedly and hinder the operation, or else he would have used his hands to push away the dentist.

Through the introduction of anesthesia in the middle eighteen forties, tooth extractions and even major surgical operations became painless.

Ether was first administered by the dentist William T. G. Morton at the Massachusetts General Hospital on October 16, 1846. The apparatus he used was much improved during the years that followed, and the whole art and science of anesthesia has been making continuous progress ever since.

720 Washington Avenue
New York 40, N. Y.

Early method of administering nitrous oxide.



Adriaen Brouwer: the Feeling. About 1630.

THEY DID IT THEMSELVES

By KAY LIPKE

There are many interesting and even inspiring stories to be told about young dentists and their wives in this country. Many of them have had the courage to get married while the men go through dental school, with the wives taking jobs to assist their husbands during the long years of study.

Then along comes a family, and the problems increase. The courage and determination seem to increase also, if the majority of these dental couples are like Doctor and Mrs. Robert Geissler of Green Bay, Wisconsin. Recently we learned about them, and thought their story would interest you.

At the moment everything is going smoothly and successfully with them. Doctor Geissler has moved into a new and very modern neighborhood bungalow office with another dentist, and he and his wife and their two children live in an attractive home of their own. There is another small Geissler on the way.

Ruth Geissler is the original do-it-yourself girl, and not only makes all her own clothes and those of the children, but has built bookcases, cut down and remodeled a big piano to match the modern decor of their home, added a breakfast bar to the kitchen, made coffee tables, painted pictures and then made the frames for them, and has redecorated the house herself whenever the need has arisen.

During her husband's first two years in dental school she took a job to help out, and worked until the first small Geissler came along. However, when the second baby arrived, she had an attack of encephalitis and for some time was extremely ill, with little or no hope held for her complete recovery.

This is when Bob Geissler took over. In addition to a heavy schedule at the University of Marquette dental school, he got up early each morning to feed his small son, himself and his sick wife. He then went to get a woman to sit during the day with his wife and son, and still made dental school on time for his eight o'clock class. He was home by four-thirty to take over the household chores, getting dinner, doing dishes and putting his son to bed, making formula and delivering it, with a supply of clean diapers, to the neighbor who was taking care of the infant daughter. That done, he returned home to wash clothes and get his wife settled for the night. He was able to start studying about midnight.

Gradually (it took about fourteen months) Ruth Geissler recovered from the very serious illness which had affected her with loss of memory, poor eyesight, and very little control of one side of her body. Now, five years later, she is living a completely normal, active life once again.

Both of them have courage and determination, and an enthusiasm for living. With Ruth Geissler, her do-it-yourself talent was developed when she was a small child and there was not enough money in the family for the things she longed to have. By the time she was ten, she was making her own clothes, and even took a blanket off her bed and made a coat out of it, when a coat was needed. "It looked nice, too," she said.

This determination to get the most out of life has come in mighty handy when it was touch and go whether she would ever recover from her illness. From what we could learn, it would seem that the Geisslers have not missed out on too many of the important activities which young dentists and their wives enjoy. They belong to both a dance club and a bridge club, and a religious discussion group as well. Doctor Geissler is president of a tri-county dental society, while Ruth Geissler spends an afternoon each week giving self-help instruction at a shelter for unwed mothers. In her spare time she writes and sells greeting card verse.

Each October, twenty-two dentists, who were classmates of Doctor Geissler at Marquette University, write a letter to the Geisslers, and Ruth mimeographs them all and sends each a copy so that all the dental friends can keep in touch through the years.

The story of Robert and Ruth Geissler is a stirring one. It represents the courage, determination, and the will to succeed of many of our young dental couples.

1993 Lucile Avenue
Los Angeles 39, Calif.

CROWNS FOR COWS

By PEARL P. PUCKETT

Back in the fall of 1958 Doctor Ward C. Newcomb, Omaha dentist, was confronted with a strange request fron an old friend, Rood Menter, owner of a vast spread of ranching land and hundreds of expensive Hereford cows.

"Ward, I want you to do something about my cows' teeth," Menter said, explaining: "A cow gets her full mouth of teeth between the fifth and sixth year, and from that time on up they must be sold for old Pearlies (beef) because they can't maintain their healthy condition. This tough grass and sandy soil ruins their teeth in nothing-flat. I pay big prices for my breeding cows, and if you can just do something to prevent them from losing their teeth it would save me thousands of dollars on replacement stock."

Doctor Newcomb had never seen a cow's mouth. He discovered that cows had no upper teeth; a full mouth consisted of only eight lowers. He also learned that the enamel covering the nerve of the tooth is so thin that the animal cannot stand heat or cold and thus cannot consume the amount of water necessary for her proper nutrition.

Back in his office, Doctor Newcomb experimented with stainless steel, which is more than a thousand times stronger than enamel. He spent weeks in going back and forth to the ranch and hammering out a special crown.

It requires only a few minutes to place eight of these stainless steel crowns on the lower teeth. Only the cows with all eight teeth erupted were crowned. The crowns are clamped tightly into the undercut and then there is no damage to the crown or root area. The crowns are placed just under the free margin of the gums. They are in every way hygienic. They will fit any degree of wear of the natural tooth.

Sixteen cows were crowned the first day at a cost of approximately $20 each. However, Mr. Menter had between seven and eight hundred more cows to crown, and ranchers from far and wide have made application for crowns.

Mr. Menter had the right idea, for the lower anterior teeth of a cow determines how long she will live, how long her nutritional standards can be met, hence her calf production. This is indeed of vital interest to cowmen and people associated with the cattle industry. With the steel crowns, the normal cow life might be extended to twenty years. At the present time, cows in the Great Plains area live only from seven to eleven years, because the tough grass and sandy soils grind the enamel. Each grass has a different abrasion factor.

"It's like conservation," Doctor Newcomb explained. "We prolong a cow's life by giving her extra years through better nutrition."

It costs a lot of money, time and care to bring a cow into production. This can be said for a bull, too. These expensive breeding cows are shipped to market as soon as their teeth are gone, hence the cows bring a low price as they usually hit the hamburger line. The cost of replacement is very high. Across the vast spread of America, the crowns should save cattlemen millions of dollars annually, as well as improve the calf crop through better nutrition.

Mr. Menter and Doctor Newcomb have patented and perfected this method of bovine dentistry. They have formed a Nebraska corporation called Bovine Crowns, Inc., at Chappell, Nebraska. The crowns are made by a Denver company and a vast supply is now on hand.

Installation of Bovine Crowns requires certain technical skills and will be made only by veterinarians or trained personnel who have familiarized themselves with the process.

Being fitted for crowns.

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